Research links aerosols to recent slowdown in global warming

20 June 2016 - A pivotal piece of Met Office research is shedding light on the contribution of volcanic and man-made aerosols in the recent slowdown in the rise of global surface warming

There has been much discussion about the causes of the observed slowdown in surface warming trends since the start of this century. New research , published today in the journal Nature Climate Change , suggests the slowdown could have been predominantly caused by regional variations in the release of man-made aerosols, particularly from China, along with effects following the eruption of Mount Pinatubo, in the Philippines, in 1991. Atmospheric aerosols are microscopic particles suspended in the Earth's atmosphere, which can cool the climate by reflecting sunlight back to space and by altering clouds.

Previous studies have established a link between the slowdown in the rate of surface warming trends and the negative phase of the so-called Pacific Decadal Oscillation (PDO) - a pattern of ocean and climate variability in the northern Pacific. But what caused the negative phase of the Pacific Decadal Oscillation was previously unknown.

Doug Smith, of the Met Office Hadley Centre, is the lead author on the paper: Role of volcanic and anthropogenic aerosols in recent slowdown in global surface warming. He said: "Our research builds on previous work, but crucially we show that the regional distribution of man-made aerosols could have driven changes in winds over the Pacific Ocean that influenced the negative phase of the Pacific Decadal Oscillation, and hence the observed slowdown in the rate of surface warming.

"The results suggest that the slowdown could have been predicted. Future reductions of aerosol emissions - that are expected as China seeks to improve air quality - could promote a positive phase of the PDO and a period with accelerated rises in global temperatures."

The research team highlights there are some early signs that the PDO may already be moving to a positive phase, which could influence global warming trends. The authors add that improved monitoring of human-emitted aerosols and a better understanding of their effects is needed to increase confidence in climate projections.

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